UDOT'S Process for Assessing Research Needs: UTRAC 2005

The process of prioritizing research needs for the Utah Department of Transportation (UDOT) is based around a collaborative, annual workshop, organized by the UDOT Research Division. This workshop has come to be known as "UTRAC", the acronym for the Utah Transportation Research Advisory Council. The UTRAC Workshop was initiated in 1993, and has been a very successful process. The process has been modified several times, and underwent some significant revisions in 2005.

The key steps employed in the 2005 research prioritization process at UDOT are shown below. Although the workshop plays a central role in the process, a number of steps are needed before and after the workshop to make the process complete. The steps are:

1. Identified key leaders in the Department to lead the Problem Statement generation process in each of eight discipline areas. Those areas are:

    a. Construction
    b. Maintenance
    c. Materials & Pavements
    d. Design (Hydraulics, Environmental, Roadway)
    e. Planning & Asset Management
    f. ITS & Traffic and Safety
    g. Geotechnical
    h. Structural

2. Assigned a person from the Research Division staff to work with each discipline group.

3. Provided training to the group leaders on the prioritization process and their role within it. Since several of the steps in the process were new, training was essential.

4. Solicited Problem Statements from each of the discipline groups (and other stakeholders), making the leader for that group responsible to lead the problem statement development process. Emphasized the need to identify a key UDOT Champion for each Problem Statement, and a plan for implementation. Problem Statements were accepted from any entity, and did not need to come through the discipline group or it's leader. Tools provided to each group leader included:

    a. List of Problem Statements from the past two years.
    b. Problem Statement form (revised from previous years).
    c. Suggestions about coordinating with contractors, consultants and key researchers during this early stage in the process to ascertain their needs, interests and resources.

5. Research Division staff contact for each discipline group reviewed the submitted Problem Statements. Their review included a literature search to determine if similar work had been performed in Utah or elsewhere, or if significant knowledge on the topic could be provided to the discussion. Project scopes were evaluated to insure that well-defined work tasks and clear deliverables were envisioned. Implementation plans were also required to be included in the scope statements. As needed, revised Problem Statements were proposed to the group leaders.

6. Convened a one-day workshop to review the Problem Statements and prioritize them. The workshop included 153 people from UDOT, FHWA, key consulting and construction firms, the three research universities in Utah, other state agencies, and the public. Elements of the workshop included:

   a. Keynote address from the Deputy Executive Director encouraging innovation.
   b. Presentations of successful research projects that have been implemented in Utah over the past years.
   c. Divided into eight working groups to evaluate the Problem Statements and the background information gathered about each one by the Research Division contact. A total of 80 Problem Statements were evaluated by the groups. The number of submitted problem statements per group ranged from three to eighteen.
   d. Prioritized the statements through a two-step voting process using weighted ballots that minimized the ability of any one subgroup to dominate the process (UDOT participants dominated the voting scheme, irrespective of the number of people present).
   e. During breaks throughout the day, groups were able to interact to share ideas, gather supporting information, and provide input on cross-discipline problems.
   f. Each discipline group concluded the workshop by submitting a list of their top three to six projects, in order of priority.

7. Research staff assembled the top Problem Statements from each discipline group into a master list of research priorities. The Master List included 32 Problem Statements.

8. Sorted the Problem Statement Master List by priority, so that the number one priority of each discipline group was shown first, followed by the number two priorities, and so on.

9. Applied the available research funding to the Master List of priority statements, starting at the top of the list and working down, yielding a list of about 25 projects which could be funded in fiscal year 2006.

10. Presented the priority list and funding scenario to the Research Division staff for their input, and to senior leaders in the Department for their feedback.

11. Made minor changes to the priority list based on feedback received and further evaluation of the Problem Statement scopes. Senior leaders requested that several projects be moved up or down in the funding list.

12. Assigned Research Division staff as Project Managers for each of the projects, and discussed possible Principal Investigators for each.

13. Submitted the final Research Priority funding list for approval by the Department and FHWA.

14. Initiated the research projects.

Background on the UTRAC Process and the 2005 Modifications

Since 1993, UDOT has used a collaborative, annual workshop format to identify the research priorities for the Department. This process had come to be called "UTRAC", named for the Utah Transportation Research Advisory Council, a group who oversaw the prioritization process. In this process, UDOT staff, key consultants, research partners, FHWA staff, and people from associated agencies gather to brainstorm and prioritize UDOT's needs. Available funding was then applied to the highest priority problem statements yielded by the workshop, in an order determined by the Advisory Council.

In late 2004, the UDOT Research Division began an initiative to improve and expand the process of defining and prioritizing the annual research agenda for the Department. The goals of this initiative were to more fully meet the needs of our UDOT customers, more completely define the appropriate questions and problems on which to focus our research resources, and to improve our record of implementation of research results. In-house evaluations had indicated that increasing the involvement of key stakeholders in the research process would yield more success and a higher level of implementation. A thorough evaluation of feedback from three years of UTRAC workshops, and some focused discussion among a select group of regular participants, identified some key changes in the process.

The key changes made to the annual workshop process were as follows:

1. Required advance submission of problem statements. In the past, problem statements were developed during a brainstorming process at the workshop, and refined during the day (or, in earlier years, two days).

2. Encouraged pre-workshop meetings within UDOT Divisions and between the Divisions and key researchers.

3. Problem Statements were reviewed to determine if significant information already existed. Prior to 2005, problem statements were developed at the workshop, so review of the existing body of knowledge on that topic couldn't take place until after the workshop.

4. Convened a workshop to focus on the refined Problem Statements, divided into eight discipline groups (defined above) to discuss and refine the statements. In the recent past, five discipline groups were used.

5. Prioritized the Problem Statements within each discipline group using a series of weighted ballots. In the past, open voting using colored dots was employed.

6. Honored the priority list from each group by funding the top project from each group before moving on to lower priority projects.

7. Eliminated the use of an external "Advisory Council" (the source of the original UTRAC acronym) in the prioritization process. This Council, made up of mid-level UDOT managers, would typically take the list of prioritized projects after the workshop, and create a funding list without regard to the order that each group placed on their projects. With the commitment to honor each group's priority, described in Item 6, above, and the reliance on UDOT Senior Leaders for prioritization review, this external Council was not needed.

The benefits achieved through this significantly modified process were as follows:

1. Problem Statements were more completely conceived and developed.

2. Problem Statements had more buy-in from key stakeholders, which will result in more successful research projects and more complete implementation of the results.

3. Participants felt that their input played a more significant role in the process, because their priorities were honored in the final funding list.

4. Conflicting priorities exhibited in past years were eliminated in this process, because of the secret ballot voting system.

5. A higher number of people participated in the workshop (153) than ever before (130).

6. Research efforts on prioritized Problem Statements began much sooner after the workshop, and results will be available for implementation in a more timely manner.

7. Research resources (manpower and budgets) were more efficiently and uniformly applied to the various discipline areas in the Department, because a project from each discipline group was funded before lower priority projects were funded.

8. A solution to one Problem Statement was identified and provided before the workshop was even held, saving thousands of dollars.

9. Other states will benefit from the results and implementation of more appropriate and efficiently executed projects done in Utah.

Feedback from the UTRAC Workshop confirmed that this revised process was a success, with better statements being presented, more informed decisions being made, and yielding a list of projects which more closely aligns with broad Department needs and the Department mission. Seventy-five percent of respondents "strongly agreed" that advance submission of Problem Statements was effective, with the other 25 percent indicating that they "agreed". Ninety-three percent of respondents indicated that they started the workshop with a good set of Problem Statements. Attendance at the workshop exceeded previous maximum attendance by 17 percent. The opportunity for this large group of transportation professionals to communicate and evaluate challenges of our industry in a proactive setting was noted as a positive attribute of this process. As one group leader remarked, "This year's UTRAC was a big improvement over the past . . . research did an outstanding job."

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